

① Find $\frac{dy}{dx}$

① (a) $y = x^2 \sin x$

① (b) $y = \frac{\cos x}{1 + \sin x}$

② A weight is hanging from a spring and is stretched down 5 units beyond its rest position and released at $t=0$. Its position at any later time t is $s = 5 \cos t$. When is the jerk equal to zero?

1. a. $y = x^2 \sin x$ $x^2(\cos x) + \sin x(2x)$
 $y' = 2x \sin x + x^2 \cos x$ $\boxed{x^2 \cos x + 2x \sin x}$

$$b) \quad y = \frac{\cos x}{1 + \sin x}$$

$$\frac{1 + \sin(x)(\sin(x)) + \cos(x)(\cos(x))}{(1 + \sin(x))^2} =$$

$$\frac{-\sin(x) - \sin^2(x) - \cos^2(x)}{(1 + \sin(x))^2}$$

$$\frac{-1(\sin(x) + \sin^2(x) + \cos^2(x))}{(1 + \sin(x))^2}$$

$$\frac{-1(\cancel{\sin(x)} + 1)}{(1 + \cancel{\sin(x)})(1 + \sin(x))} = \boxed{\frac{-1}{1 + \sin(x)}}$$

$$s(t) = 5 \cos t$$

$$v(t) = -5 \sin t$$

$$a(t) = -5 \cos t$$

$$j(t) = 5 \sin t \quad \text{zero at } 0, \pi, 2\pi, 3\pi, 4\pi$$

$n\pi$ where n is an integer

- HW • Study 3.1 + 3.4 for the quiz Tuesday
- Weekly Review due Tuesday — make it good